



CSREES Administrator's Report to the Partnership

Spring 2009

The mission of the Cooperative State Research, Education, and Extension Service (CSREES) is to advance knowledge for agriculture, the environment, human health and well-being, and communities.



The Next Big Thing

How will agriculture's Next Big Things affect society?

The Fall 2008 Administrator's Report to the Partnership looked at some of the "next big things" in agriculture science and education, as seen through the eyes of CSREES national program leaders (NPL). In this edition, CSREES Administrator Dr. Colien Hefferan asked NPLs to look 5 years into the future and identify high priorities for federal support that focus on serving people. These programs range from youth development and nutrition education, to pest management and legal issues in agriculture, to climate change and globalization.

Agricultural science involves far more than research in laboratories and fields. As a mission-focused set of disciplines, agriculture demands that the science enterprise encompass not only discovery, but also application, adoption, and diffusion of knowledge. It is built on the continuous generation of retooled and new scientists who understand the challenges of both using and conserving natural resources as a base for production, and on refreshing scientific priorities by listening to all those who work in the vast agricultural and related sectors and synthesizing the issues they face.

There is no endeavor in the world more pervasive than the production of food, fiber, and now fuel, with its corollary responsibility for sustaining the resources on which this production is based. This most primary of industries is essential to the well-being of all people—both as producers and consumers—and no one falls outside this system, with the very rare exception perhaps of a few, vestigial hunters and gatherers. Thus, the agenda of agricultural science is broad, reaching all people, influencing many aspects of day-to-day life. The ultimate goal of agricultural science is to improve the lives of people, and to achieve that goal fully, tools of discovery, training, technology transfer, and public communications (e.g., research, education, and extension), are all necessary. To be effective, the National Institute of Food and Agriculture will need to support each of these functions, both as stand-alone activities and as integrated programs.

In looking to the future of agricultural science and education, especially in the context of establishing the National Institute, staff of the current Cooperative State Research, Education, and Extension Service have identified high priorities for federal support to a range of public and private institutions, focused on serving people. These high-impact programs include implementing mission mandates for youth development through the 4-H programs, whose national headquarters will remain as an essential element of the Institute. Support for the 4-H program is expanding as both federal and private partners realize the value of its time-tested, core approach to instilling leadership skills through practical, hands-on education. Similarly, the constantly refreshed, science-based nutrition education programs offered through the Cooperative Extension System, including the Expanded Food and Nutrition Education Program (EFNEP) and the Supplemental Nutrition Assistance Program - Education (SNAP-Ed, formerly FSNE), are highly effective in creating sustained improvements in the nutritional choices of families and leading to improvements in both health and personal finance.

The agricultural knowledge system has taken on an expanded role in communities as first responders in times of natural and potentially man-made disasters. The Extension Disaster Education Network (EDEN) represents a coalition of permanent, community-based experts with extensive knowledge of science, and the backing of the Land-Grant University System, to provide training in preparation for, and effective response to floods, storms, fires, terrorist attacks, and other disasters. EDEN has expanded the purpose, value, and functions of Cooperative Extension in communities.

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Agricultural science serves the needs of citizens in countless other ways, whether through knowledge-based planning and training, such as the Master Gardener Program, or plant and animal diagnostics through the National Laboratory Networks and innovative spin-offs, such as the integrated pest management Pesticide Information Platform for Education (the ipmPIPE program). ipmPIPE has saved soybean producers millions of dollars worth of unneeded fungicides and acres of farmland from unnecessary fungicide application and holds promise for addressing other issues in production agriculture. These programs expedite the diffusion of science to solve immediate problems.

A major purpose underlying the creation of the National Institute of Food and Agriculture is to elevate the role and perception of agricultural science. A critical road to achieving that goal is to keep the central focus of the Institute on the purpose-driven nature of science for agriculture. Whether fundamental or applied research, support for higher education, or adoption and diffusion of agricultural science and technology through extension, the agricultural science system serves to improve the day-to-day lives of people, today and into the future. This clear, but complex and multi-faceted mission of the Institute needs to be reflected in its fundamental design, execution, and support. Everyone but those hunters and gatherers are counting on it.

Colin Heyzeran

Big and Emerging Issues

The aging of our population poses myriad issues that our country will face in coming decades in terms of nutrition, health, and family dynamics, such as financial security and food access. The United States is currently experiencing a dramatic change in demographics; older adults are living longer, growing in numbers, and are healthier than ever before. In addition, many people are changing the way they view retirement. Volunteerism and community service will play a much greater role than they have in the past.

Extension can be positioned to ensure relevance and public value to this population. For example, obesity and associated chronic disease (diabetes, heart disease, cancer, etc.) will continue to be a major problem in the United States into the foreseeable future. In addition to adequate, healthy food and good decisionmaking,

there is need to better address physical activity in our programs to all ages.

Food Insecurity is also a growing concern.

- Will food insecurity issues lead to changes in agricultural production practices (e.g., small family farms vs. mega-farms) and how will this impact on the rural community?
- With a volatile economy and food production and purchasing costs on the rise, it is increasingly important to make sure that low-resource families, farmers, and others have the ability to stretch their food dollars, save money, and assure good food choices.
- If food becomes more expensive, how do we contribute to access to food through community resources such as food banks? How do we help communities ensure that resources are available to low-income families and others who are in need? *

NUTRITION & FAMILY SCIENCES

The Health and Well-Being of People and Communities

Everything we do within the context of food and agricultural sciences at CSREES has the potential to impact the health and well-being of people and communities. Increasingly, CSREES' federal and national partners, including the Department of Defense and multiple agencies of the Department of Health and Human Services, look to our research, education, and extension functions and the capacity of our system to fill tremendous gaps in research-based outreach to geographically isolated and underserved people and communities.

CSREES is viewed as the highly respected "go to" federal partner with the strength of history and trust to meet the increasing challenges and opportunities related to enhancing quality of life, health, and well-being. How our research translates to benefit people and communities is critical to the future. No one federal agency or program can meet the challenges ahead; it is only through the internal alignment and integration of our functions and programs, and the strength of our partnerships within the context of our sciences, that we can promote a healthier future for our ultimate stakeholders—the people of this nation.

Whether we are talking about nanotechnology, global climate change, food safety, animal health, financial security, family life education, or biosecurity, we are ultimately talking about the health and well-being of people. Understanding the human dimensions of our unique sciences is critical to fully realizing the potential of our work. The national extension system is a CSREES asset that no other federal agency has. In fact, this aspect of our agency's work often attracts major collaborative partnerships and funding from other federal agencies. *

Caroline Crocoll

Acting Director for Nutrition and Family Sciences

Suzanne Le Menestrel

Acting Director of Youth Development

BIG THINGS are on the Horizon for 4-H

Engaging Youth in Science

Society faces enormous challenges related to water use, energy consumption, environmental health, global climate change, food safety, obesity, and community engagement. The uniqueness of the 4-H program lies with the research, teaching, and outreach efforts supported by our agency and delivered by land-grant universities.

4-H has a tremendous opportunity in the next 3-5 years to re-engage with the work of all facets of agricultural research and education. 4-H'ers benefit from access to the most relevant and cutting-edge research, educational programs, and learning opportunities. Based upon the premise that began the 4-H idea, young people will play a critical role in learning about, disseminating, and affecting critical societal issues—just as they did in the early "corn and canning clubs" in rural America. Through a more integrated approach, youth will

- learn about global climate change and engage in community efforts to minimize its negative impacts;
- have opportunities to see and experience how water use is connected to everything they do, from the clothes they buy and the paper they write on, to the food they eat;
- work virtually as they increase their knowledge and refine their practices related to food animal production, use new technologies, and engage with sciences and practitioners around the country; and
- address the growing problems related to obesity by developing and implementing programs that encourage more physical activity and healthy food choices. *

There are important opportunities for development and growth for 4-H and the extension system at large, ranging from re-connecting with science and the great outdoors, to volunteerism and a focus on quality.

4-H as an Outdoor Classroom

Cooperative Extension's expertise in research, education, and extension and the 4-H focus on hands-on, non-formal, experiential education, as well as the transfer of new technologies, demonstrates the relevancy of re-connecting youth with nature.

Climate change, pollution, endangered species, disappearing open spaces, and erosion have all become timely topics for today's generation and those in the future. Future programmatic efforts must be based on sound research and practices that allow young people to actively engage in addressing these and other critical issues in communities around the country. 4-H has a strong tradition of environmental education—resident and day camps, wildlife education, water conservation, outdoor adventure, forestry, fishing, shooting sports, and many other projects teach young people about our natural world.

While the previous programs have been successful, we must develop new strategies and approaches that will appeal to today's creative, innovative, and interactive young people. 4-H must build upon its strengths in environmental programming and engage the expertise in the agency and the land-grant universities to strengthen and enhance its programs. Outdoor recreation makes major contributions to local, regional, national, and global economies and science suggests quality outdoor recreation experiences can lead to healthier, active lifestyles. Managers, policymakers, and communities need science-based strategies to meet the challenges of providing and managing sustainable outdoor environments for recreational experiences. *

Strengthening Volunteerism

Communities rely heavily on volunteers who contribute their time, energy, and talents to meet current and emerging issues. For more than a century, volunteers have been vital to the development and growth of Cooperative Extension programs, serving youth, families, and all communities. Challenging economic conditions and increasingly complex societal issues place additional stresses on community volunteers.

Youth development programs, including 4-H, rely on volunteers in community clubs, after-school programs, resident and day camps, school enrichment, and many other delivery methods. Trends show that the volunteers, their interests, time commitment, and level of expertise are all changing. The Cooperative Extension System, and specifically 4-H Youth Development,

needs to review its approach to engaging volunteers in order to maintain strong local community support. *

4-H Mission Mandates

The 4-H youth development program, through its Science, Engineering, and Technology (SET), Healthy Living, and Citizenship mission mandates, is uniquely positioned to positively engage young people in high-quality, hands-on educational programs. While the mission mandates are not new, we expect to see more outcomes from our recent efforts in the next 5 years. This renewed emphasis on mission mandates is the first time that 4-H has looked at these areas in a holistic, comprehensive manner, with concentration on evaluation and professional development, and with so much involvement from across the 4-H system. *

"Regulation of Agricultural Producers"

Bill Hoffman
National Program Leader
for Animal and Plant Biosecurity

Agricultural producers are facing unprecedented regulatory demands that will demand new management practices. Unfortunately, educational/extension support for these demands is not currently provided, in a coordinated fashion, nationwide. Such coordinated educational/extension support will be achieved only through truly trans-disciplinary (as opposed to multi-disciplinary) approaches.

Historically, agricultural education and extension have addressed these demands on an issue-by-issue basis. Examples of these continually evolving issues include

- agricultural labor issues (social security and income tax withholding, immigration, and worker protection);
- farm finance (tax, crop insurance, and farm program issues);
- environmental protection issues (conservation program compliance and pesticide applicator certification); and
- rural urban interface (concentrated animal feeding operations and local ordinances).

These requirements are fluid and require continual educational and extension updates. In this decade alone, agencies have proposed or implemented the following new regulations:

- **U.S. Food and Drug Administration:**
Premise registration for many value added agriculture activities
- **USDA's Animal and Plant Health Inspection Service:**
A voluntary animal identification system at the federal level that has become required by some state and private organizations
- **U.S. Department of Homeland Security (DHS):**
Information regarding "chemicals of interest," as articulated in the Chemical Facility Anti-Terrorism Standards
- **DHS:** Drafting rulemaking documents to register ammonium nitrate sellers and require background checks and registration of ammonium nitrate buyers (Secure Handling of Ammonium Nitrate Program)
- **U.S. Environmental Protection Agency:**
Plans new regulations for farm fuel tanks.

While no one regulatory action may be difficult with which to comply, the collective amount of management resources required for federal, state, and local regulatory compliance have increased dramatically and will increase in the future. More effective compliance support from land-grant universities could lead to more efficient management, allowing increased time for non-regulated best management practice implementation. *

Agricultural fields continue to expand and we can expect to see the focus on legal and social science issues sharpen dramatically in the future. The following issues are just a few things the leaders in agriculture need to think about as they prepare to assist the next generation of producers, educators, extension professionals, researchers, and others into the 21st century.

Legal Issues—the full range of agriculture/food legal issues—have truly taken root. In fact, many in the ag law arena believe we are headed into at least one, if not two decades where "ag law" will be recognized as critically important to food/ag success and growth. Specifically:

- Environmental services and sustainability legal issues:
 - Carbon market regulation and impacts on participants (including landowners/producers)
 - Liability associated with Life Cycle Analysis (LCA) and sustainability indicators
 - Land tenure and leasing issues related to carbon credits and transfer of property upon which environmental services activities occur
 - Remedies associated with failure of carbon market compliance, including
- who can enforce, fraud in the market, etc.
- Educational programs for producers and landowners related to these rapidly developing issues
- Food safety and traceability liability
- Legal issues in the local/regional food sector
- The need to re-examine existing state and local agriculture and food related laws to ensure compatibility with "new generation" issues and challenges

Estate Planning & Farm Succession:

- How the next generation will take control of the land and societal costs for failure to ensure farm succession
- How to ramp up estate planning and farm succession activities at the landowner level (current surveys reflect less than 30 percent of current landowners in key farm states have estate planning/farm succession plans in place)
- Providing education to "new farmers" and "beginning farmers"—what do they need to succeed and who will deliver this information?
- Energy inefficiencies of existing farms/ranches and impacts on new owners/operators
- Caring for the needs of older, retiring producers while attending to the needs of new producers
- Addressing the farm family financial management needs

THE GROWING IMPORTANCE OF LEGAL AND SOCIAL ISSUES IN AGRICULTURE

Janie Hipp

National Program Leader
for Farm Financial Management,
Risk Management Education,
and Beginning Farmers and Ranchers

Financial Management at the Farm Level—improvement of farm management business skills for all producers, but particularly new producers of all types

- Adjustment to any additional new credit/access to credit impacts of current economic circumstances
- New decision-support tools
- New risk management tools

Changing Demographics of American Food and Agriculture:

- Women and working lands
- New immigrants; part-time, hobby, and retirement farmers; Native American producers; and others—how will we identify and meet the education, extension, and research needs for these owners/operators?
- Inclusion and diversity challenges

The Environment, Life Cycle Analysis (LCA), and Sustainability:

- LCA—the next big thing for agriculture research:
 - Ensuring the social sciences—economics, social research and law/policy—are included in work to assess the total
- Sustainability—ensuring social sciences are included in sustainability policy transformation
- Unintended consequences of rapid movement in sustainability transformation
- Agriculture's role in biofuels production and biofuels markets
- Landowner's rights, roles, duties, and responsibilities associated with evolving land and resource rights and the bio/alternative energy arena (wind energy, gas exploration, solar, etc.)—education needs?
- Agriculture and research agriculture/food sector involvement in the "next green revolution"

Entrepreneurship in a Legally and Sustainable Manner:

- Demands on agricultural infrastructure to support new entrepreneurship opportunities
- New business relationships to support new infrastructure needs *

Mike McGirr
Acting Director
of the International
Programs Office

Globalization is not a new phenomenon—
an estimated 50,000 years ago a small
group of humans walked out of Africa in
search of better food and security, and the
world has been growing closer ever since.

A SHRINKING WORLD

While globalization can be credited for tremendous strides that have benefitted mankind, it also has brought with it some problems, including the spread of diseases; invasive species; economic competition and the dislocation of jobs; transient disparities in the distribution of wealth; environmental degradation; and, increased migration of populations and clashes between cultures. How our country faces the challenges and seizes the opportunities will largely determine our quality of life in the coming decades.

As with other sectors, globalization dramatically affects agriculture. In today's world, agricultural issues are inextricably linked with international economic development, natural resource management, energy dependence, climate change, and human health—all while trying to meet the growing food demands of a burgeoning world population. The following is a

short list of the global issues that will affect agriculture and rural development in the next 5-10 years:

- **Global food security:** Rising incomes in developing countries are changing food consumption patterns; unstable or volatile fuel prices and diverting crops for biofuel production are contributing to increased food prices; and trade restrictions by some countries are keeping commodities out of the international marketplace. The world's poor, who can spend as much as 80 percent of their income on food, are especially vulnerable.
- **International trade:** Increased international competition, new foreign market opportunities, the impact of trade liberalization on rural communities, and how developed nations' agricultural subsidies affect the poor's ability to compete are all concerns.

- **Natural resource management:** Today, a third of the world's population lacks access to adequate supplies of fresh water. That figure is expected to rise significantly in the next 20 years and affect millions of Americans. As the major user of the world's freshwater supply, the agricultural sector will need to develop technologies that are more efficient. Deforestation will continue to impact climate change and contribute to soil erosion and loss of species.

- **Other:** Increased international commerce has heightened the potential for invasive species and the transfer of diseases from animals to humans. Food safety issues will become more prominent as international trade increases.

The increasingly global nature of agricultural knowledge systems and the benefits derived from sharing subject matter expertise and information across borders offers opportunities for new programs, partnerships, and services. 🌱

CHOICES, CONSEQUENCES & DISTRIBUTION

Although it is difficult to predict accurately, the consequences of the choices that we have made and continue to make will determine the "next big ideas" that will require federal assistance.

The focus of future federal assistance programs needs to be on discovering and applying new knowledge to evaluate the consequences of choices we are making today, including distributional consequences and mitigating adverse impacts. This knowledge needs to be linked to education and outreach programs that will help farmers, ranchers, citizens, and policymakers make better choices. More importantly, there will be a greater need in the next decade for interdisciplinary focus on discovering and applying new knowledge, especially within agricultural economics and law, to evaluate the distributional consequences of the choices that we make. The following areas provide the greatest challenges and opportunities:

CHALLENGE:
Enhancing Equity and Efficiency in Agricultural Markets and Exports

CHOICE:
Equity vs. efficiency in the food and agricultural system

ISSUES:
Resolving

- Opportunities and threats of globalization
- Market failure
- Unintended consequences (of markets and policies)

CHALLENGE:
Protecting and Enhancing the Environment

CHOICE:
Consuming now vs. saving for the future

ISSUES:
Defining and valuing

- Land ownership and stewardship
- Private goods/public value
- Equitable distribution of benefits and costs

CHALLENGE:
Promoting Food Security, Human Health, and Well-being

CHOICE:
Competition for resources – food/feed vs. fiber vs. energy

ISSUES:
Enhancing

- Production of alternative energy
- Access to nutritious food
- Protection of human health and well-being

CHALLENGE:
Community Economic Development in a Legally and Economically Sustainable Manner

CHOICE:
Public vs. private and human vs. physical investments

ISSUES:
Resolving

- Appropriate business development and entrepreneurship
- Avoiding unintended consequences by public decisionmakers
- Adequacy of infrastructure (physical, social, and institutional) 🌱

Fen Hunt

National Program Leader
for Environmental
Resource Economics

This mandates a more global perspective to ensure that our food imports are safe from not only pathogens and insects, but also melamine and other contaminants. It also means the nation must secure its ability to produce food and agricultural products at a time of diminishing water, environmental constraints, and increasing competition for land use. Other challenges include:

- **Changing ownership of land to more corporate investors, including foreigners, and professional managers.** Currently, 60 percent of agricultural acreage is rented, and that is expected to increase. The target audience for research and extension is broadening from solely traditional producers to include professional managers.
- **Expanding extension to both a public and private effort.** Serving private consultants, such as certified crop advisors, who now advise on 75 percent of cropland.
- **Developing a more international business approach.** Successful farmers report they would send their children to a private business school rather than an agricultural school. There is a need to understand foreign currency exchanges and import/export markets. There is also a need for other expertise, such as robotics. Most business schools

BUSINESS+

For the first time in the nation's history,
food imports exceed food exports.

now require a summer abroad program, but many ag students still do not learn a foreign language or get international experience.

• **Developing food sustainability standards.** Major corporations are working on environmental footprint standards for food production, and outside vendors are trying to establish international sustainability standards and verification services. Social fairness and other labeling issues may also be required and verified. Customer pressure on international vendors may require changes in animal welfare regulations, such as egg layer cage sizes.

• **Consolidating programs.** There are land-grant universities in five Midwestern states that no longer offer poultry programs; they

have merged to offer one summer course between them. We need more multistate programming as many university departments downsize and consolidate. We need more internationalization and coordination with peer universities, such as those in the Netherlands, Australia, New Zealand, and Israel. China, India, and other countries are moving to expand expertise in some engineering, water management, and other specialties. eXtension will further consolidate outreach by taping and archiving guidance of the best experts and fact sheets in their disciplines. Rapid response technology for pest and disease outbreaks needs to be shared with industry representatives as a public/private partnership.

SOCIAL ISSUES

- **Changing education demographics.** Although more city kids and females are entering the field, agriculture is not yet reflective of current U.S.

student trends of 21 percent Hispanic, 17 percent black, 5 percent Asian, and 1 percent Native American (according to National Center for Education Statistics). More can be done to introduce kids to agriculture, such as grades 4-6; track them from high school to 2-year, 4-year, and advanced programs; and tie in with real job opportunities to meet current industry needs.

- **Paying more attention to consumer issues.** Some grocery chains and restaurants are trying to address consumer trends for products that are organic, low environmental footprint, animal welfare, non-genetically modified organism, and antibiotic- and hormone-free. It is not just low cost-per-unit of production, customers are looking for more variety and unique foods. 🌱

Mary Ann Rozum

National Program Leader
for Conservation and Environment

WORKFORCE DEVELOPMENT

INFORMATION + INTEGRATION

Several challenges loom on agriculture's horizon, but those requiring the most urgent attention are education and workforce development, the rapid dissemination of accurate information, and integration of effort.

The most critical of these challenges is education and workforce development in systematics (taxonomy). This is huge—not glamorous, but a key to almost every sustainable ecosystem management problem you can name.

Case in point: Invasive species will continue to be a major problem for agriculture and public health, in the broadest sense. Identifying potential pests at the species level is a key to any response and attempt at management. Expertise is not available for many groups of plants, pathogens, and arthropods and the situation is rapidly getting worse due to retirements and the inability to attract students.

The following approaches are needed, with equal urgency:

- **Morphological approach.** We need field specialists who can identify whole organisms. For key pest groups, they simply no longer exist.
- **Molecular approach.** Economical, rapid, molecular-based identification capability is needed for closely related potential pests. Such tools either do not exist or are too expensive for most pest groups.

This issue is a major, shared concern for sister agencies within USDA—the Agricultural Research Service, Animal and Plant Health Inspection Service, Forest Service, and Natural Resources Conservation Service will all be greatly affected by the loss of expertise needed to identify potential invasive pests. This issue can move from “challenge” to “opportunity” in the following ways:

- **A role for federal assistance.** Graduate fellowships, assistantships, and scholarships could support the education of students in key disciplines, such as plant pathology, weed science, and entomology. Currently, graduate assistantships in this area are almost non-existent.
- **An opportunity to form partnerships.** Common needs make this area a fertile ground for partnerships within USDA and across other federal agencies and departments, such as the National Science Foundation, National Institutes of Health,

Department of Energy, Department of Defense, and U.S. Environmental Protection Agency. In addition, state departments of agriculture are potential partners. Possibilities also exist for international collaborations and cooperation.

The need for rapid (near real-time), accurate dissemination of information to manage pest problems also is critical. Users of this information include commodity groups, state and county-based specialists, crop producers, and end-users. To that end, the integrated pest management Pest Information Platform for Extension and Education (ipmPIPE) is one of the best innovations associated with land-grant universities and extension. The eXtension effort provides a platform for expanded real-time information. New Communities of Practice will almost certainly focus on pest issues, and ipmPIPEs could be important management components for end-users.

This area is fertile ground for public-private partnerships based on common needs. State and local groups, including commodity groups, are potential partners as are international collaborators where threats exist for invasive or resurgent local pest species.

Lastly, integration of effort is important for the future of agriculture. Most agricultural and environmental problems are extremely complex. We need to think about integration at two levels (or of two types, i.e., Little I and Big I):

- **Little I:** fairly common—for example, the integration of natural science discipline areas, botany, zoology, entomology, plant pathology, weed science, ecology, etc.
- **Big I:** relatively rare—for example, integration of natural sciences with economics, sociology, psychology, law, etc. This type of integration will become more important and will equal the more common integration across science disciplines.

All of these efforts will benefit from focusing on K-12 science education that addresses the importance of agricultural food systems. 🌱

Rick Meyer

National Program Leader for Biobased Plant Management